

To: Robin, George[Robin.George@epa.gov]
From: Andrews, Kathleen@DOC
Sent: Wed 3/20/2013 3:59:50 PM
Subject: RE: For discussion

Thanks for clarifying!

Yes, my diagrams show one well, but we've got several situations with numerous wells.

I have two situations of immediate concern. One is an injection project where the operator is proposing to convert two injection wells which are a couple hundred feet apart, and there are 440 wells, including about 13 injectors, within a 1/4-mile radius. We identified 79 wells in that radius that don't have adequate isolation. This sounds like an expensive proposition to remediate these wells, and we're aware we may already have a situation where injection is likely to be affecting the USDW. That situation is like my scenario "C" on my sketches. At the moment, the Division is on hold with our evaluation of their wells, and we are suggesting that the operator obtain water samples above the zone where the 9,000 ppm sample was obtained. This is driving me crazy, because actually there is only the one 9,000 ppm water sample, and I see no reason to suspect that there's lower salinity water between the oil-producing zone and the surface, so why we are putting the operator through the exercise of collecting water samples just seems misguided.

The other situation of immediate concern is like a combination of my scenarios "A" and "D" on my sketches. There are 79 wells, two which are close to each other that are proposed for conversion from production to injection, and there are already two injectors within the 1/4-mile radius. On one side of the fault, there's the situation of lower-than-10,000 ppm salinity from the producing zone to the surface, and complex geology as in "D". We're having trouble defining the base of the USDW for several reasons, including the salinity issue, discontinuous layers, and the near-vertical layers on the north side of the fault. I don't know how we would define the base of the USDW on the north side of the fault, but the way things are going, it looks like the Division would be asking the operator to collect water samples from boreholes. At this field, we have recent fluid level measurements at the 7 idle wells for which we have fluid levels, the fluid levels are 49 to 2141 feet above the layer we are currently using for USDW, which is the top of a hydrocarbon producing zone. There's a shallower producing zone that extends partway across the field, just to keep things interesting! It looks to me like a perfect situation to work on an aquifer exemption, but everybody else seems to be pulling out every tool they can think of to avoid going down that road. We are concerned that getting the Water Board to agree to the exemption would be blocked by fear of making a decision, and fear of public scrutiny/reaction, real or imagined. A few aquifer exemptions have been pursued in the Bakersfield district, but not in living memory in our district. I'm not sure how much traction the argument that the groundwater has always been impacted from the hydrocarbon zones to the surface as evidenced by the tar seeps at the surface would get (the tar has to get from the hydrocarbon zones to the surface somehow!), but it sounds reasonable to me.

I'm the newest associate in the UIC group, and it's a challenge finding a path among a couple of other people with many years of experience, who are also in a 'figure these new situations a day at a time' mode. We have a new supervisor, who came from the California DTSC about two years ago. He's very bright, and learns fast, but he doesn't have a wealth of experience in injection wells, and the combination of fear of public scrutiny, the fact that the Division only started tackling these injection projects in the detailed way that we are now three years ago, and a year ago started wrangling with this 10,000 ppm concept has us all a bit lost. Still, my supervisor would like me to use just our local expertise, and is discouraging me from calling Jerry Salera in Sacramento, so at the moment my talks with you and David Basinger are on the QT. I feel that getting advice from the EPA is essential, so thus I'm calling....I'm hoping we can talk again soon.

Kathleen Andrews

Associate Oil and Gas Engineer

Division of Oil, Gas and Geothermal Resources

Cypress, California

714-816-6847

From: Robin, George [mailto:Robin.George@epa.gov]

Sent: Wednesday, March 20, 2013 7:32 AM

To: Andrews, Kathleen@DOC

Subject: RE: For discussion

Hi Kathleen,

Well it is I who must apologize – I may have (pretty sure I did) sound a little “goofy” yesterday because I was taking one of those medicines that make one drowsy.

I finally realized that you were not talking about a single well but a field or smaller reservoir. That can become complicated very fast.

I remember discussing with your agency's Rob Habel a field that was a brain twister (especially for an alert brain) as possible communication, possible contamination pathways were making pressure/volume analysis more critical, less determinable. So, the best approach is that of yours and many others nationwide in UIC – collaboration and communication.

Ok, I will look up some applications of pressure calculations, reference material, etc. and forward them to you.

Is Ali Khan your District Manager?

George Robin (robin.george@epa.gov)

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From: Andrews, Kathleen@DOC [<mailto:Kathleen.Andrews@conservation.ca.gov>]

Sent: Tuesday, March 19, 2013 3:31 PM

To: Robin, George

Subject: RE: For discussion

Thank you so much for your time today, and apologize for taking time away from meeting your deadline. I'm very interested in discussing further. I have a lot to learn, and would like to set up a time for another conference call.

Kathleen Andrews

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From: Robin, George [<mailto:Robin.George@epa.gov>]

Sent: Tuesday, March 19, 2013 2:41 PM

To: Andrews, Kathleen@DOC

Subject: RE: For discussion

http://www.epa.gov/ogwdw/uic/pdfs/Historical/techguide_uic_intro_tech_subsurf_inj_1977.pdf

From: Andrews, Kathleen@DOC [<mailto:Kathleen.Andrews@conservation.ca.gov>]

Sent: Tuesday, March 19, 2013 2:08 PM

To: Robin, George

Subject: FW: For discussion

Here you go:

Kathleen Andrews

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From: Andrews, Kathleen@DOC
Sent: Friday, March 15, 2013 3:36 PM
To: 'basinger.david@epa.gov'
Subject: For discussion

I found ways to sketch the background for several more of the questions that we discussed.

I'm looking forward to our discussions next week, with George and possibly folks in other regions.

Thanks in advance.

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